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ABSTRACT

The Hiskey-Nebraska Test of Learning Aptitude (H-NTLA) (Hiskey, 1966) has been regarded by reviewers as one of the best instruments for assessing the learning abilities of hearing-impaired children. However, there has been a paucity of research on the validity of this test. Further, there is no established test-retest reliability, and questions have been raised about the standardization procedures. Several studies are presented which demonstrate the usefulness of this test. Substantial relationships are shown between the H-NTLA and academic achievement and between the H-NTLA and language ability. Further, the H-NTLA is found to have adequate test-retest stability. A potential problem was found with the deaf norms which appear to yield an unexpected high number of subjects with extreme high and low scores. (Author)

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The Hiskey-Nebraska Test of Learning Aptitude in Hearing-Impaired Samples

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Abstract

The Hiskey-Nebraska Test of Learning Aptitude (H-NTLA) (Hiskey, 1966) has been regarded by reviewers as one of the best instruments for assessing the learning abilities of hearing-impaired children. However, there has been a paucity of research on the validity of this test. Further, there is no established test-retest reliability, and questions have been raised about the standardization procedures. Several studies are presented which demonstrate the usefulness of this test. Substantial relationships are shown between the H-NTLA and academic achievement and between the H-NTLA and language ability. Further, the H-NTLA is found to have adequate test-retest stability. A potential problem was found with the deaf norms which appear to yield an unexpected high number of subjects with extreme high and low scores.

The Hiskey-Nebraska Test of Learning Aptitude in Hearing-Impaired Samples

The Hiskey-Nebraska Test of Learning Aptitude (H-NTLA) (Hiskey, 1966) was designed to assess the intellectual ability of deaf children. The H-NTLA consists entirely of nonverbal tasks, is administered through standardized, pantomimed directions, and was normed on a deaf population. It has been cited as the best test available for assessing the learning ability of hearing-impaired children (Salvia and Ysseldyke, 1981; Newland, 1972). However, recent reviews (Salvia and Ysseldyke, 1981; Bolton, 1978; Newland, 1972) have noted the absence of test-retest information and have raised questions about the adequacy of the norms for the deaf. Further, there is a paucity of information on concurrent and construct validity (Salvia & Ysseldyke, 1981). Studies by the authors and their colleagues will be presented which fill some of the gaps in knowledge about the H-NTLA.

The H-NTLA and Academic Achievement

The earliest study (Giangreco, 1966) to explore the relationship between the H-NTLA and academic performance of deaf children yielded correlations in excess of .50. These findings, however, were not replicated in a subsequent study (Hirshoren, Hurley, & Kavale, 1979; Hurley, Hirshoren, Hunt, & Kavale, 1979) who concluded that the H-NLTA is of little or no value for predicting achievement levels of hearing-impaired children.

Method

Subjects. The subjects were 55 students, 29 boys and 26 girls, attending a midwestern state school for the deaf. Subjects had received the H-NTLA according to the pantomime directions and achieved a Learning Quotient (LQ)[1] of 70 or greater. The mean age was 13.8 years (SD = 2.9) and the mean LQ was 103 (SD = 17.9). The hearing losses of the subjects were: 36 profound; 16 severe; 3 moderately severe (Goodman, 1965).

Procedure. The H-NTLA, Peabody Individual Achievement Test (PIAT) (Dunn & Markwardt, 1970), and Woodcock Test of Reading Mastery (Woodcock, 1973) were administered according to standardized directions. The Stanford Achievement Test (Madden, Gardner, Rudman, Karlsen, & Merwin, 1972) had been administered at the school. In this and all subsequent studies, all measures were administered in total communication, that is, spoken and signed modes with the exception of the H-NTLA for which pantomime directions were used.

Results

Table 1 shows the partial correlations between LQ and achievement scores with age effects removed.

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[1]Hiskey (1966) has recommended that the performance of hearing-impaired children on the H-NTLA be interpreted in terms of the Learning Quotient and learning ages to avoid the possible "misuse" associated with IQ. Hiskey does, however, use the terms IQ and mental age in the interpretation of hearing children's performance on the H-NTLA.

Table 1

Partial Correlations Between H-NTLA LQ and Achievement Measures

Achievement Measure	n	r
Stanford Achievement Test		
Reading Comprehension	46	.46**
Spelling	35	.27
Math. Concepts	44	.48**
Math. Computation	45	.62**
Math. Applications	35	.28*
Woodcock Reading Mastery		
Word Identification	51	.63**
Passage Comprehension	51	.60**
Peabody Individual Achievement Test		
Spelling	44	.60**
Reading	51	.65**

*$p < .05$

**$p < .001$

Discussion

All correlations were significant with the exception of the Stanford Spelling Test, which suggests that the H-NTLA is of value

in interpreting individual differences in academic performance among deaf students. Attenuation in the LQ scores in the Hirshoren et al. (1979) study may account for their negative findings.

The H-NTLA and Language

The diagnosis of language disorders in deaf children is based on findings of language below expectations for the degree of hearing loss and IQ. Because there have been only a few reports of the association between nonverbal intelligence and language in hearing-impaired samples, Watson, Sullivan, Moeller, and Jensen (1982) studied the relationship between the H-NTLA and the language in deaf children.

Method

Subjects. The subjects were 25 children, 14 boys and 11 girls, at two midwestern state schools for the deaf. The mean age was 8.1 years SD = 1.3). The hearing losses of 19 subjects were profound and 6 severe (Goodman, 1965).

Procedure. These tests were administered in random order: the H-NTLA, the Test of Language Development (TOLD) (Newcomer & Hammill, 1977), and the Reynell Developmental Language Scales (Reynell, 1977).

Results

Table 2 shows the correlations between the H-NTLA LQ and the language measures with age and sex effects partialed out.

Table 2

Partial Correlations Between LQ Scores

and Language Scores

Language Measures	r
Reynell	
Expressive	.400*
Receptive	.304
TOLD	
Expressive	.432*
Receptive	.533**
Language Quotient	.572**

*$p < .05$

**$p < .01$

Discussion

The correlations between LQ and language in this hearing-impaired sample are similar to findings between nonverbal intelligence and language performance in normal-hearing children (Zimmerman and Woo-Sam, 1972). It should be noted that language performance was very attenuated, as expected with a deaf sample

(i.e., Geers & Moog, 1978). Attenuation in language along with the strength of the LQ-language correlations suggests that nonverbal intelligence may be a relatively important factor in the success of some hearing-impaired children in acquiring language and the failure of others.

Test-Retest Stability of the H-NTLA

In this project, Watson (1983) examined the test-retest stability of the H-NTLA. There were no previously published reports on either the test-retest reliability or stability of the H-NTLA.

Method

Subjects. The subjects were 21 boys and 22 girls who were students at a state school for the deaf. All students had taken the H-NTLA on two occasions. The mean age for this group at the time of first evaluation was 10.3 (SD = 3.2) and 12.6 (SD = 3.1) at the second. The hearing losses of 27 subjects were profound, 13 severe, and three moderately severe (Goodman, 1965).

Procedure. Tests were administered as described above.

Results

The mean interval between tests was 36.9 months (SD = 23.5). The correlation between the first and second test for the total sample was .749. Table 3 shows the correlations between the first and second tests as a function of the time interval between tests.

Table 3

Correlations Between First and Second Tests as a Function of Time Interval Between Tests

Time Interval	n	r
0-24 Months	13	.791*
25-48 Months	14	.849*
> 49 Months	16	.624*

*$p < .005$

Discussion

Test-retest correlations obtained for one and three year intervals in this hearing-impaired sample are similar to those for normal children (Conklin & Dockrell, 1967; Honzik, MacFarlane, & Allen, 1948). The correlation obtained in the current study for subjects tested after 49 months or more is similar to findings with adults in studies using the Wechsler Adult Intelligence Scale (Wechsler, 1955) (Kangas & Bradway, 1971; Klonoff, Fibiger, & Hutton, 1970).

Deaf Norms

Questions have been raised about the representativeness of the deaf standardization sample (Bolton, 1978) and about the small

number of subjects at the lower ages (Salvia & Ysseldyke, 1978). The present study compares the distribution of scores obtained on the H-NTLA with those obtained from the Wechsler scales (Wechsler, 1955, 1967, & 1974) for the same children.

Method

Subjects. The subjects were 71 students, 38 boys and 33 girls, at a midwestern state school for the deaf. The mean age was 13.2 years (SD = 3.6). The hearing losses of 44 subjects were profound, 22 severe, and 5 moderately severe (Goodman, 1965).

Procedure. The H-NTLA and the Wechsler Performance Scale (WPPSI, WISC-R, or WAIS) were administered.

Results

The H-NTLA LQ scores and Wechsler Performance IQ scores were compared to the scores obtained in the WISC-R standardization sample (Wechsler, 1974). Table 4 shows the number of subjects falling into each of four categories of IQ or LQ. Significant chi squares were obtained for the comparisons between H-NTLA LQ and WISC-R standardization frequencies ($\chi^2(3) = 57.16$, $p < .001$) and between the Wechsler Performance IQ and WISC-R standardization frequencies ($\chi^2(3) = 13.64$, $p < .01$).

Table 4

Frequency of LQ and IQ Scores

IQ/LQ Category	H-NTLA LQ	Wechsler Performance IQ	Expected Frequencies[a]
69 and Below	10	6	1.56
70-89	10	13	15.76
90-119	37	47	46.79
120 and Above	14	5	6.89

[a]Expected frequencies are the product of the percentages in the WISC-R standardization sample (Wechsler, 1974) times the number of subjects in the current study.

Some difference in the distribution of IQ scores in a deaf sample versus a random sample is expected due to the greater incidence of multiple handicaps in a deaf sample. However, it is not logical to assume a greater number of superior individuals in a deaf sample. Table 4 shows 14 subjects with superior LQ scores versus 6.89 expected on the basis of the WISC-R standardization sample.

Chi squares were again calculated without the mentally retarded subjects. A significant chi square was found for the comparison

between the H-NTLA and WISC-R standardization sample ($\chi^2(2) = 12.52$, $p < .01$), while a nonsignificant chi square was obtained for the comparison between Wechsler Performance IQ and the WISC-R standardization sample ($\chi^2(2) = .760$, n.s.).

Using the four broad categories defined in Table 4, 11 of the 14 subjects who were classified as superior (120 and above) on the basis of the H-NTLA LQ score would not have been classified as such using the Weschler Performance IQ. More importantly, of the ten subjects classified as falling within the mentally retarded range (69 and below) using the LQ, five received scores in the low average (80 - 89) or average (90 - 109) range on the Weschler scales. Overall, using these four categories the two measures disagreed on the classifications of 23 of the 71 subjects (31%).

Discussion

The H-NTLA yielded more subjects with extreme scores (i.e., scores less than 70 and greater than 119) than the Wechsler Scales. Clinicians should regard extreme scores on the H-NTLA cautiously in the absence of other supporting data.

Conclusion

These studies lend support for the use of the H-NTLA in assessing learning abilities of hearing-impaired children. Substantial relationships were found between performance on the

H-NTLA and academic achievement and between the H-NTLA and language ability. Further, adequate test-retest stability was demonstrated. The finding of an unexpected number of subjects achieving extreme scores on this test suggests caution in the interpretation of such scores.

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